REMARKS / ARGUMENTS

1.0 Rejections under 35 U.S.C. §101:

The Office Action rejected claims 1-11 under 35 U.S.C. §101 as being directed towards non statutory subject matter. In particular, the Office Action indicates that in accordance with USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility," dated 22 November 2005, that computer-readable medium type claims should recite language that limits the computer-readable medium to include "encoded with (stored thereon, embedded with, or embodying) a computer program."

In response, Applicants have amended claim 1 to recite the following: "A computer-readable medium ***encoded with a computer program*** having computer executable instructions for..." It is believed that this amendment fully complies with the Interim Guidelines since the claim now includes a version of one of the acceptable formats suggested by the Office Action.

Therefore, Applicants respectfully request withdrawal of the rejection of claims 1-11 under 35 U.S.C. §101 based on the above described amendment.

2.0 Rejections under 35 U.S.C. §112:

The Office Action rejected claims 5 and 7 under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as his invention.

In particular, the Office Action suggests that the term "second error threshold" in claim 5 fails to include proper antecedent basis. Similarly, the Office Action also

suggests that the term "third error threshold" in claim 7 fails to include proper antecedent basis. Applicants respectfully traverse the rejections of claims 5 and 7.

Specifically, with respect to claim 5, the term "***a second error threshold***" is used to differentiate the particular error threshold being used from a different error threshold being introduced in claim 2 that refers to "a first error threshold." Similarly, with respect to claim 7, the term "***a third error threshold***" is used to differentiate the particular error threshold being used from a different error threshold being introduced in claim 2 that refers to "a first error threshold," and the error threshold introduced in claim 5 that refers to "a second error threshold."

In other words, there are ***three different error thresholds being used in different dependent claims***. Consequently, Applicants believe that properly identifying each of these three different thresholds a ***first***, ***second***, and ***third*** threshold is the best, and clearest, way to "*particularly point out and distinctly claim the subject matter which applicant regards as his invention*."

The only other alternative that Applicant can envision to describe these different thresholds would be to use language such as:

- "a unique error threshold associated with the first set of MVs" for Claim 2;
- "a unique error threshold associated with the optimal MVs of the second set of MVs" for claim 5; and
- "a unique error threshold associated with the optimal MVs of the second set of MVs for use in determining contents of the third set of MVs" for claim 7.

Unfortunately, while the above language may be technically accurate, Applicants believe that the above language is overly confusing, especially with respect to the use of the term "unique error threshold" and particularly with respect to the two different

"unique thresholds" associated with the MVs of the second set of MVs per claims 5 and 7. In fact, Applicants respectfully suggest that one skilled in the art reading the above described alternate language might not realize that in fact, three different thresholds (i.e., a "first," "second," and "third" threshold) were being discussed.

Therefore, Applicants respectfully suggest that the original language of claims 1, 5 and 7 represent the most descriptive and concise language possible for alerting a reader of those claims to the fact that there are three different thresholds being referred to with respect to those claims. Consequently, as noted above, Applicants respectfully traverse the rejection of claims 5 and 7 under 35 U.S.C. §112 on the grounds that claims 5 and 7 "*particularly point out and distinctly claim the subject matter...*"

3.0 Rejections under 35 U.S.C. §103(a):

The Office Action rejected claims 1-11 under 35 U.S.C. §103(a) as being unpatentable over ***Straasheijm*** (U.S. Patent 6,968,009) in view of ***Ma*** (U.S. Patent 7,072,398).

In order to deem the Applicant's claimed invention unpatentable under 35 U.S.C. §103(a), a prima facie showing of obviousness must be made. However, as fully explained by the M.P.E.P. Section 706.02(j), to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, ***to modify the reference*** or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, ***the prior art reference (or references when combined) must teach or suggest all the claim limitations***.

Further, in order to make a prima facie showing of obviousness under 35 U.S.C. 103(a), all of the claimed elements of an Applicant's invention must be considered,

especially when they are missing from the prior art. If a claimed element is not taught in the prior art, then no prima facie case of obviousness exists. The Federal Circuit court has stated that it was error not to distinguish claims over a combination of prior art references where a material limitation in the claimed system and its purpose was not taught therein (*In Re Fine*, 837 F.2d 107, 5 USPQ2d 1596 (Fed. Cir. 1988)).

3.1 Rejection of Claims 1-11:

The Office Action of April 6, 2007 rejected independent claim 1 based on the suggestion that the proposed ***Straasheijm – Ma*** combination reference discloses the Applicants claimed "... computer program... for automatically estimating a motion field for image frames in an image sequence..." However, as discussed in further detail below, the Office Action takes an overly broad view of the language of claim 1 by quoting only a portion of the claimed limitations with respect to computation of motion vectors (MVs). Further, by taking this overly broad view of claim 1, the Office Action has improperly characterized the claimed invention.

For example, in rejecting claim 1, the Office Action states that the ***Straasheijm*** reference teaches "***evaluating a second set of candidate MV's for each block in the frame based on the first set***" (Straasheijm: figure 5; column 4, lines 42-45, wherein the second set is the search performed in the half-scaled frame).

However, the Office Action ***misquotes*** and ***mischaracterizes*** the second element of claim 1. Specifically, the Office Action fails to quote the actual text of the second element of claim 1 which includes the following: "evaluating a second set of one or more candidate MVs for each block ***in the image frame for which the first set of zero valued MVs was deemed not reliable***..."

Clearly, the Office Action substitutes the language "***based on the first set***" for the actual claim language which recites "***in the image frame for which the first set of***

zero valued MVs was deemed not reliable." As such, the Office Action fails completely to address the fact that the claimed second set of MVs is computed specifically for ***only*** those blocks having ***unreliable*** zero-valued MVs in the first set.

Clearly, the ***Straasheijm*** reference discloses computing a rough or initial estimate of MVs using a "rough search" that is then refined by performing a second search using the offsets that were found in the initial rough search. (Straasheijm: figure 5; column 4, lines 42-45, wherein the second set is the search performed in the half-scaled frame). As such, it should be clear that ***Straasheijm*** does not perform a second level search with respect to ***unreliable*** blocks.

Note that the Office Action attempts to address the issue of reliability by citing the ***Ma*** reference. In particular, the Office Action states that "Ma discloses an apparatus that determines a 'reliability of each MV' (Ma: column 8, lines 1-5, wherein the reliability is the matching error)..."

However, ***Ma*** is very clear on the use of comparing "matching errors" to "thresholds." Specifically, as disclosed in column 8, lines 1-9, of the ***Ma*** reference, ***Ma*** teaches that a "matching error" of a block is evaluated relative to a fixed or adaptive "threshold" to determine whether a motion block is associated with the "no-motion activity region." In addition, ***Ma*** teaches that if the "matching error" of a particular block is less than the "threshold," then the "***the search ends... for the current block...***" (emphasis added). Consequently, combining the ***Straasheijm*** and ***Ma*** references would seem to produce an MV evaluation scheme wherein "thresholds" are used to ***terminate*** further evaluation of particular blocks whenever a block "matching error" is below a threshold.

In stark contrast, the Applicants are specifically claiming performing a secondary evaluation of blocks whenever the initial MV assigned to a block is deemed ***unreliable***. Consequently, Applicants respectfully suggest that the claimed invention is clearly

performing a claimed operation that is neither disclosed nor in any way suggested by any reasonable interpretation of the proposed ***Straasheijm*** – ***Ma*** combination reference.

A similar problem exists with respect to the Office Action's misquoting and mischaracterization of the third element of claim 1. In particular, the Office Action discusses the third element of claim 1 by suggesting that ***Straasheijm teaches*** "'evaluating a third set of MV's for all blocks in the image ***based on either the first or second set of MV's***' (Straasheijm: figure 5; column 4, lines 47-54, wherein the third set is the third search performed on the fill frame)" (emphasis added).

Clearly, the Office Action fails to properly quote the actual text of the third element of claim 1 which includes the following: "evaluating a third set of candidate MVs for all blocks in the image ***frame having MVs that were deemed not reliable using the first or the second set of MVs***..." Consequently, it is obvious that the Office Action has substituted the language "***based on either the first or second set of MV's***" for the actual claim language which recites "... ***having MVs that were deemed not reliable using the first or the second set of MVs***...." As such, the Office Action fails completely to address the fact that the claimed third set of MVs is computed specifically for ***only*** those blocks having ***unreliable*** MVs in either the first set or second set.

As discussed above, ***Ma*** teaches termination of MV searching for blocks having a "matching error" less than some "threshold." As such, the proposed ***Straasheijm – Ma*** combination reference fails completely to disclose, or in any way render obvious, the claimed element of "***evaluating a third set of candidate MVs*** for all blocks in the image ***frame having MVs that were deemed not reliable using the first or the second set of MVs***..."

Thus, it is clear that the present invention, as claimed by independent claim 1 includes elements ***not taught*** in the proposed ***Straasheijm – Ma*** combination reference, or in any way rendered obvious by the proposed ***Straasheijm – Ma*** combination reference. Consequently, the rejection of independent claim 1 and of dependent claims 2-11, under 35 U.S.C. §103(a) is not proper. Therefore, the Applicants respectfully traverse the rejection of claims 1-11 under 35 U.S.C. §103(a), and respectfully request reconsideration of the rejection of these claims in view of the novel language of claim 1. In particular, claim 1 recites the following novel language:

> "A computer-readable medium encoded with a computer program having computer executable instructions for automatically estimating a motion field for image frames in an image sequence, said computer executable instructions comprising:
>
> evaluating a first set of zero valued motion vector (MVs) for blocks in an image frame using background detection and determining a reliability of each MV;
>
> ***evaluating a second set of one or more candidate MVs for each block in the image frame for which the first set of zero valued MVs was deemed not reliable***, said second set of MVs being determined using any of spatial and temporal neighbors of each of those blocks, and determining an optimal MV for each block of the second set and a reliability of each optimal MV;
>
> ***evaluating a third set of candidate MVs for all blocks in the image frame having MVs that were deemed not reliable using the first or the second set of MVs***, said third set of MVs being determined using a block-based pattern search, and determining an optimal MV for each block of the third set; and
>
> outputting an optimal MV for each block using the reliable MVs from the first, second and third sets of MVs to form a motion field for the image frame." (emphasis added)

CONCLUSION

In view of the above, it is respectfully submitted that claims 1-11 are in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of claims 1-11 and to pass this application to issue. Additionally, in an effort to further the prosecution of the subject application, the Applicant kindly invites the Examiner to telephone the Applicant's attorney at (805) 278-8855 if the Examiner has any questions or concerns.

Respectfully submitted,

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